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08/009,833 01/27/93 ROBINSON

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EXAMINER

PATRICIA GRANAHAN  
HAMILTON, BROOK, SMITH & REYNOLDS  
TWO MILITIA DRIVE  
LEXINGTON, MA 02173

18N1/0820

1813

DATE MAILED: 08/20/93

This is a communication from the examiner in charge of your application.  
COMMISSIONER OF PATENTS AND TRADEMARKS

ART UNIT

PAPER NUMBER

S 6

This application has been examined  Responsive to communication filed on \_\_\_\_\_  This action is made final.

A shortened statutory period for response to this action is set to expire 3 month(s), 30 days from the date of this letter.  
Failure to respond within the period for response will cause the application to become abandoned. 35 U.S.C. 133

**Part I THE FOLLOWING ATTACHMENT(S) ARE PART OF THIS ACTION:**

1.  Notice of References Cited by Examiner, PTO-892.  
2.  Notice of Draftsman's Patent Drawing Review, PTO-948.  
3.  Notice of Art Cited by Applicant, PTO-1449. 2 pages  
4.  Notice of Informal Patent Application, PTO-152.  
5.  Information on How to Effect Drawing Changes, PTO-1474.  
6.  \_\_\_\_\_

**Part II SUMMARY OF ACTION**

1.  Claims 1-18 are pending in the application.  
Of the above, claims \_\_\_\_\_ are withdrawn from consideration.  
2.  Claims \_\_\_\_\_ have been cancelled.  
3.  Claims \_\_\_\_\_ are allowed.  
4.  Claims 1-18 are rejected.  
5.  Claims \_\_\_\_\_ are objected to.  
6.  Claims \_\_\_\_\_ are subject to restriction or election requirement.  
7.  This application has been filed with informal drawings under 37 C.F.R. 1.85 which are acceptable for examination purposes.  
8.  Formal drawings are required in response to this Office action.  
9.  The corrected or substitute drawings have been received on \_\_\_\_\_. Under 37 C.F.R. 1.84 these drawings  
are  acceptable;  not acceptable (see explanation or Notice of Draftsman's Patent Drawing Review, PTO-948).  
10.  The proposed additional or substitute sheet(s) of drawings, filed on \_\_\_\_\_, has (have) been  approved by the  
examiner;  disapproved by the examiner (see explanation).  
11.  The proposed drawing correction, filed \_\_\_\_\_, has been  approved;  disapproved (see explanation).  
12.  Acknowledgement is made of the claim for priority under 35 U.S.C. 119. The certified copy has  been received  not been received  
 been filed in parent application, serial no. \_\_\_\_\_; filed on \_\_\_\_\_.  
13.  Since this application appears to be in condition for allowance except for formal matters, prosecution as to the merits is closed in  
accordance with the practice under Ex parte Quayle, 1935 C.D. 11; 453 O.G. 213.  
14.  Other

**EXAMINER'S ACTION**

PTOL-326 (Rev. 2/83)

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15. Applicant is required to update the status of the parent application.

16. The disclosure is objected to because of the following informalities: page 1, lines 18 "response" should be 5 "responses", line 21, "immunologies" should be "immunology's", page 1, line 13 "response" should be "responses", line 21, "antigen" should be "antigens"., page 13, line 31, the Robinson reference is incomplete. In the abstract, line 11, "response" should be "responses". Appropriate review and correction of the 10 entire specification are required.

17. Claims 1-18 are rejected under 35 U.S.C. § 112, first paragraph, as the disclosure is enabling only for claims limited to a method of immunizing a vertebrate by administering a DNA transcription unit encoding H1 and H7 influenza hemagglutinin 15 antigens and a method of protecting birds. See M.P.E.P. 706.03(n) and 706.03(z). The specification does not enable a method of immunizing animals with a DNA transcription unit encoding all antigens (viral) or all influenza hemagglutinin subtypes. There is no indication that the influenza viral 20 hemagglutinins of the H1 and H7 subtypes sufficiently cross react with other influenza viral hemagglutinin subtypes (e.g. H3) such that the responses would be comparable in terms of protection. Additionally, there is no indication of cross protection between 25 types (i.e. types A or B influenza viruses). Therefore the specification is not commensurate in scope with the claims.

The following is a quotation of 35 U.S.C. § 103 which forms

the basis for all obviousness rejections set forth in this Office action:

5        A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

10        Subject matter developed by another person, which qualifies as prior art only under subsection (f) or (g) of section 102 of this title, shall not preclude patentability under this section where the subject matter and the claimed invention were, at the time the invention was made, owned by the same person or subject to an obligation of assignment to the same person.

15        18. Claims 1-4 are rejected under 35 U.S.C. § 103 as being unpatentable over King, 1991 (Biotechnology News, vol. 11, no. 28, page 5). King describes a gene delivery technique in which the gene for gp120 protein of the AIDS virus was incorporated into a plasmid under the control of the CMV (cytomegalovirus) 20 promoter sequence (page 5, abstract). Administration of the expression vector generated both cellular and humoral immune responses in mice to the gp120 protein. While King does not specifically describe a method of immunizing animals, it is stated that the technique is useful in immune therapy and may be 25 an alternative to vaccination in cases of chronic infections and might also be applicable to disease states other than HIV. It 30 would have been obvious to one of ordinary skill in the art, therefore, at the time the invention was made to employ the gene

delivery technique in a method of immunizing animals against viral infection with the expectation, barring evidence to the contrary, that the technique would generate specific humoral and cellular immune responses to a variety of antigens.

5        19. Claims 15-18 are rejected under 35 U.S.C. § 103 as being unpatentable over WO 90/11092 in view of Huylebroeck et al, 1988 (Technological Advances in Vaccine Development). WO 90/11092 describes a method of delivering a polynucleotide into the interior of a vertebrate cell (abstract). The method includes 10 isolation of DNA and linking of the DNA to non-retroviral promotor sequences such as SV40 and CMV (page 19, lines 9-19). The method can be used to generate humoral immune responses or cell-mediated immune responses or both (page 14, lines 28-34) depending on the DNA incorporated. Also suggested are routes of 15 administration of the polynucleotide which includes inhalation of an aerosol to the mucous membranes of the nose and throat (page 43, lines 11-21), intradermal, intravenous and intrathecal administration (page 11, lines 27-37). WO 90/11092 does not specifically describe a method of immunizing a vertebrate with a 20 transcription unit encoding an influenza antigen. However, Huylebroeck et al describe viral delivery systems in which DNA encoding the influenza viral hemagglutinin is incorporated into SV40 expression plasmid (page 279, figure 1 and table 1). Also described is a recombinant vaccinia virus expression system 25 encoding the influenza viral hemagglutinin which system is useful for animal inoculation (page 284). It is suggested that the use

of the recombinant vaccinia virus expression system would eliminate the need for purification of HA antigen (page 284, second paragraph). Given the importance of the influenza virus and the importance of the hemagglutinin in the generation of 5 protective immune responses, it would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teachings of WO 90/11092 on delivery of polynucleotides to vertebrate tissues, with the teachings of Huylebroeck et al on the construction of non-retroviral 10 expression vectors encoding the influenza viral hemagglutinin, to include the DNA encoding viral hemagglutinin from influenza in a DNA transcription unit. A method of immunizing an animal including humans with the DNA transcription unit would have also been obvious, with the expectation, barring evidence to the 15 contrary, that the DNA transcription unit would avoid the need to purify the HA antigen before use and the transcription unit would also generate humoral and cell-mediated immune responses when administered in vivo. To administer the transcription unit via the intranasal route would have been obvious given the fact that 20 a natural route of infection for the influenza virus is through the nasal cavity. Combining preparations intended for vaccination purposes with physiologically acceptable carriers and excipients is well within the level of skill in the art.

20. Papers related to this application may be submitted to 25 Group 180 by facsimile transmission. Papers should be faxed to Group 180 via the PTO FAX Center located in Crystal Mall 1. The

faxing of such papers must conform with the notice published in the Official Gazette, 1096 OG 30 (November 15, 1989). The CMI FAX Center number is (703) 305-3014. The hours of operation of the center are 8:45 am - 4:45 pm, Monday - Friday.

5 21. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Lynette F. Smith whose telephone number is (703) 308-3909.

Any inquiry of a general nature or relating to the status of this application should be directed to the Group receptionist  
10 whose telephone number is (703) 308-0196.

Smith/lfs *lys*  
August 17, 1993

CHRISTINE M. NUCKER  
SUPERVISORY PATENT EXAMINER  
GROUP 180